Abstract

A plasma etch process for organic low- k dielectric layers using NH_3 only, or NH_3 /H_2 or NH_3 /H_2 gases. A low k dielectric layer is formed over a substrate. A masking pattern is formed over the low k dielectric layer. The masking pattern has an opening. Using the invention's etch process, the low k dielectric layer is etched through the opening using the masking pattern as an etch mask. In a first embodiment, the etch process comprises: etching the low k dielectric layer by applying a plasma power and flowing only NH_3 gas. In a second embodiment, the etch process comprises: etching the low k dielectric layer by applying a plasma power and flowing only NH_3 /H_2 gas. In a third embodiment, the etch process comprises: etching the low k dielectric layer by applying a plasma power and flowing only NH_3 / N_2 gas. The invention's NH_3 containing plasma etch etches organic Low k materials unexpectedly fast. The invention's NH_3 only etch had a 30 to 80% high etch rate than N_2/H_2 etches of low-k materials like Silk ™.